Australian Society for Limnology Inc.

NEWSLETTER

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ASL Australian Society for Limnology

AUSTRALIAN SOCIETY FOR LIMNOLOGY INC.

The Australian Society for Limnology Inc. (ASL) is an Australian based scientific society whose focus is the study and management of inland waters. The ASL was established in 1961, and has a current membership of over 650 researchers, managers, engineers, teachers and tertiary level students from all states and territories. Members have a strong professional interest in inland aquatic issues, including the maintenance of biodiversity, the maintenance and/or restoration of water quality, and the wise use of aquatic resources. The Society also has a strong interest in fostering the scientific and intellectual development of tertiary students.

The Society includes members working in government agencies, tertiary institutions and many industries related to aquatic resources. Through their daily activities, members have contact with local communities and are in a sound position to interpret and advise on inland water issues. The Society has a substantial knowledge base, and has assumed a responsibility to ensure that this is available to those who manage inland waters.

Accordingly, the charter of the ASL is to further our understanding of Australia's inland waters and to promote their wise use and sustainable management. In this manner we will contribute to the continued existence of this valued resource and the maintenance and enhancement of the quality of life for all Australians. The ASL regularly produces a newsletter with notes on limnological activities, articles of interest, book reviews and announcements of upcoming events likely to be of interest to Members.

ASL Home Page
www.asl.org.au

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CONTENTS

PRESIDENT's REPORT 5

EDITOR'S NOTE 6

UPCOMING CONFERENCES 7

ANNOUNCEMENTS 11

STUDENT ANNOUNCEMENTS 12

GENERAL ANNOUNCEMENTS 13

REPORTS FROM THE TRENCHES 16

ASL EXPERTS 27

ASL SUBS 30

REGIONAL EXECUTIVE MEMBERS 2011 31

PRESIDENT's REPORT

Welcome to another year of limnology and I am very pleased to have the opportunity to serve as ASL president. Thank you to Darren Baldwin as outgoing president who has provided much needed on the job training that I hope will help over the next couple of years. Thanks must also go to Andrew Brooks, Joanne O'Connor, Michael Reid, and Patrick Laceby, and especially to Sabine Schreiber for their efforts as members of the executive.

The AGM at Thredbo highlighted to me just how much interest and passion there is within our membership, and it was great to see an active debate about the future of our society. This year's congress in Brisbane from September 26-30th follows the theme of '*Variability and the future of aquatic ecosystems in Australia and New* Zealand', and will be a celebration of our 50th anniversary as a society, a joint meeting with the NZFSS and linked to the Riversymposium. Registration is still open and we have had an outstanding number of abstracts submitted hinting it will be a great congress. We just need Fran to organise some nice weather; I still have no idea what was on the other side of the clouds at Thredbo.

The new Executive have held their first couple of meetings since the congress and focused on the congress and addressing the issues raised at the AGM. Below is a snapshot of the ideas we would like to follow over the next year:

- **Membership of FASTS** – I have sought information from both FASTS and the current representative of the Aquatic Cluster to clarify issues such as communication among members of the Cluster, past and proposed input to FASTS and, and achievements and outcomes for the Cluster through FASTS. This evidence will help our decision on future ASL membership of FASTS.
- **ASL has a Constitution!** Surprising (and exciting) as that may seem, our Constitution drives the way the Society and its members operate. We are currently undertaking a review of the Constitution so that it aligns better with how we currently operate. We welcome help from any interested members, or those that simply have trouble sleeping.
- **Return of ASL Pub Nights.** Scott Hardie and the Tasmanian ASL'ers have put together a program of seminars and events (with financial support from ASL) to help local ASL members get together and discuss all things limnology. We would like to encourage local groups of ASL members (regional centres, universities, agencies etc...) to put together their own Pub Night seminar series as a forum for interacting with members and perhaps encouraging others to join. Please contact me if you are interested.
- **ASL webpage.** In 1999 the ASL President wrote "...one day our website will be the world's window to the society. We are told that websites will be the first port of call and one-stop-shops for information where global citizens can be inspired by our activities". It seems the luddites were wrong and the web is indeed our conduit to members and the rest of the world. Over the next few months we plan to update our webpage and introduce new features that will allow for improved information exchange for members, so that scholarships, jobs, reports or websites can be communicated to members more effectively.

Hope to see you all in Brisbane

Darren Ryder
20 June 2011

EDITOR'S NOTE

Well a very brief note from me. My apologies for some of the rather slow turnover on the newsletters recently – blame it on the combined joys of teaching, PhD student's finishing, trying to write grants and being 'restructured' here at Monash.

Yes I know, moan moan, complain complain, whine whine.

Hopefully with this issue we are back on track for timely production!

A number of people have been kind enough to point out mistakes in the newsletter that have persisted for some time. Please let me know directly if you see these (at ross.thompson@monash.edu) and I will correct them. In particular please check the experts list at the end of the newsletter. It has been updated this issue but could still be more accurate I am sure.

There was an issue with me using an out-dated version of the Executive list in the last issue for which I apologise.

Enough from me, thanks for the contributors to this edition.

Deadline for the next edition is the 15th of September.

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UPCOMING CONFERENCES

Joint Australian Society for Limnology and New Zealand Freshwater Sciences Society meeting 2011 will be held in Brisbane. Queensland.

ASL Celebrates it's 50th Annual Congress this year at the Brisbane Convention Centre, Southbank Brisbane.

This will be a joint congress with the **New Zealand Freshwater Sciences Society**.

The Theme of this year's joint congress is:

"Variability and the future of aquatic ecosystems in Australia and New Zealand"

The Congress dates are Monday September 26th from 6pm to Friday 30th September. The 14th International Riversymposium is also being held this week at the Brisbane Convention Centre. The Riversymposium Committee have invited our delegates to join them on Monday 26th September.

Accommodation is limited and expensive in Brisbane so please book as soon as you register. Please refer to the options and conditions on the accommodation page.

A preliminary programme is available to assist you with dates and bookings.

12th International Symposium
on Aquatic Oligochaeta

Fremantle, Western Australia
2012

The 12th International Symposium on Aquatic Oligochaeta will be held in Fremantle, Western Australia, in September 2012.

The international oligochaete symposia are held every three years and encompass all aspects of research into the biology, ecology, biodiversity and systematics of marine, estuarine and freshwater oligochaetes and some related worms.

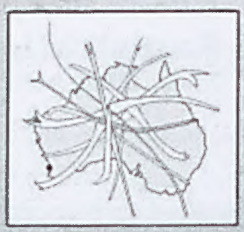
There are over 300 species of marine and freshwater oligochaetes known from Australian marine and inland waters, though many remain undescribed and there are undoubtedly many that are undiscovered.

Poster or oral presentations from Australian aquatic researchers dealing with oligochaetes, even if they constitute only a small aspect of your research will be very welcome. Otherwise, this will be a great opportunity to learn more about these ecologically important, but frequently neglected, components of aquatic communities.

It is likely that a workshop on identifying Australian aquatic oligochaetes will be held as part of the symposium, with sessions run by leading taxonomists.

More information is available at www.isaob12.net.au or email adrian.pinder@dec.wa.gov.au

Adrian Pinder
Senior Research Scientist
Department of Environment and Conservation



12th International Symposium on Aquatic Oligochaeta

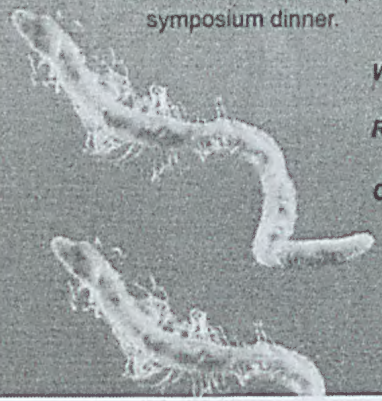
Fremantle, Western Australia 10-14 September 2012

Researchers with an interest in marine and inland water oligochaetes are invited to this 12th international symposium

Scope: The meeting will bring together scientists from around the world to discuss the latest in aquatic oligochaete research. Previous symposia have covered a very wide range of disciplines including systematics, conservation, physiology, ecology, toxicology, wasterwater treatment and biological monitoring. We expect this meeting to be as diverse.

Conference location: The Esplanade Hotel in the centre of Fremantle. Fremantle is a historic and multicultural port city located at the mouth of the Swan River, near Perth in south-western Australia.

Program: Oral and poster scientific sessions, microscopy session, identification workshop, day excursion to Rottnest Island and symposium dinner.



Website: www.isaob12.net.au

Registration: Form available late 2011.

Contact: Adrian Pinder
ph +61 (0)8 94055153
adrian.pinder@dec.wa.gov.au

Department of Environment and Conservation

ESA2011 Conference Online Registration now open!

Why attend the ESA2011 Conference?

The Annual Conference of the Ecological Society of Australia is the pre-eminent conference event in ecology in the southern hemisphere, bringing together the best and brightest ecologists from academic, government and non-government backgrounds in Australia, New Zealand and internationally. We welcome practitioners and students from a range of disciplines to facilitate broad conversation within the areas of natural resource management, conservation biology and ecological science.

Be inspired and challenged by keynote speakers including:

- Professor David Bowman, University of Tasmania
- Dr Steve Nicol, Australian Antarctic Division
- Mr Nick Mooney, Wildlife Biologist, Tasmania
- Professor Kath Dickinson, University of Otago
- Dr Beth Fulton, CSIRO

The response for our call for symposia topics has been overwhelming. Australia's leading ecological scientists will be tackling many key challenges including:

- Changing ecology at the top - Australian alpine biodiversity
- Forest management in temperate Australia - applied ecology, enlightened self-interest or something more?
- Greening of arid Australia: opportunities and lessons from extreme years
- Indigenous Australia: culture and conservation
- New approaches to an old question: functional and phylogenetic insights into community assembly
- New approaches to conservation in a changing climate: species translocation as an adaptation strategy
- Poised between population irruption and collapse - what does the ecology of Callitris teach us about Australian environmental history?
- Recreation ecology
- The importance of the past the palaeoecological context of modern landscapes
- The role of ecology in sustaining change in agricultural landscapes
- Restoring Australia's top-order predator communities
- Managing biodiversity in changing landscapes - integrating science and policy
- Genomic approaches for ecosystem and experimental ecology - functional ecology in soil and marine ecosystems
- Restoration: A structural and functional approach

An exciting and diverse range of concurrent sessions addressing the conference theme "Ecology in Changing

Landscapes" will be presented by a variety of speakers from all over the country.

For further information and program updates visit the conference website at http://www.esa211.org.au/.

Establish and grow your professional networks, and have fun doing it.....

This conference will inspire challenging dialogue across all fields of ecology and link ecological research with practical conservation biology. We hope to stimulate debate and challenge current thinking, particularly with reference to the need to mainstream climate change ecology. While many of the problems facing natural systems have not changed, ecologists today are increasingly called upon to consider multiple issues. Are the ecological questions and methods of the past still relevant and are they up to the questions of the future? Workshop and field trips will provide ample opportunities to discuss and re-invigorate working relationships along with the social program will provide for a stimulating and enjoyable week.

We look forward to welcoming you to Hobart!

Visit www.esa2011.org.au to register.

Photo from: http://www.rotarnet.com.au/users/9/98302/hobart.gif

STUDENT ANNOUNCEMENTS

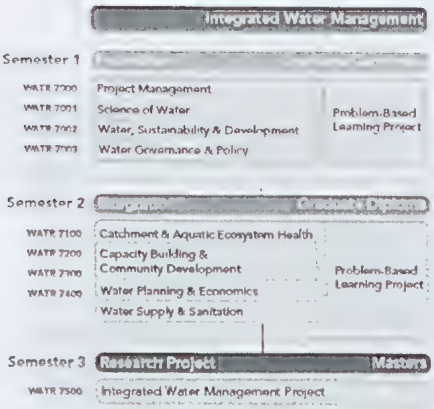
INTERNATIONAL WATERCENTRE

Master of Integrated Water Management

Graduate Certificate and Graduate Diploma
Full-time and part-time/distance

In the complex world of climate change and population growth, water professionals can no longer focus on a single aspect of water management. Solving water related problems requires technical and scientific expertise and greater understanding and integration of environmental, social and political factors.

Program structure (Full-time)


Integrated Water Management
Semester 1
WATR 7000 Project Management
WATR 7001 Science of Water
WATR 7002 Water, Sustainability & Development
WATR 7003 Water Governance & Policy
Problem-Based Learning Project
Semester 2
WATR 7100 Catchment & Aquatic Ecosystem Health
WATR 7200 Capacity Building & Community Development
WATR 7300 Water Planning & Economics
WATR 7400 Water Supply & Sanitation
Problem-Based Learning Project
Semester 3
Research Project
Masters
WATR 7500 Integrated Water Management Project

For part-time/distance see www.watercentre.org/education/programs/part-time

Qualification from four leading universities

Students enrol at The University of Queensland (Brisbane). The program is managed by IWC and delivered by lecturers from all IWC member universities. Upon graduation students receive a co-badged qualification.

Griffith MONASH University

Three of our member universities are ranked in the top 100 universities of the world in the Times Higher Education World University Rankings.

Great incentives to enrol

- Field trips (Western Australia, Stradbroke Island and others) are included in the tuition fees.
- Masters and Diploma students receive $1,000 toward professional development.
- Masters students also receive up to $1,000 to support their third semester project.

Practical and applied components

The program builds on students' professional experience to approach water-related problems holistically

- **Lecture modules** teach knowledge and skills across a wide range of disciplines.
- **Team projects** allow students to apply their knowledge to real case studies in Australia and overseas.
- **Field visits** throughout Australia complement project work and give students first-hand water system experience and knowledge.
- **Network building** encourages students to establish links through the IWC's network of national and international specialists.
- **Skills development** allows students to gain practical skills to analyse and solve water-related problems.

Our graduates will acquire

- **Communication skills** across disciplines and sectors, and sciences and policy
- **Systems thinking skills** for the whole-of-water cycle
- **Collaboration skills** for cross-sectoral teamwork
- **Problem-solving skills** for complex issues requiring difficult tradeoffs
- **Risk assessment and planning skills** to devise sustainable solutions
- **Adaptive and reflexive learning skills**, i.e. an ability to learn by doing and applying context-specific solutions.

Paul Greenfield, AO
Vice Chancellor
The University of Queensland

There are no courses in Australia, and very few internationally, that take such an integrated approach to teaching and learning about water management.

www.watercentre.org

GENERAL ANNOUNCEMENTS

The AUSRIVAS course is now enrolling!

AUSRIVAS
Australian River Assessment System

The AUSRIVAS Online training course is offered twice yearly by the University of Canberra and eWater CRC. The course aims to teach the skills and knowledge needed to assess river health using the Australian River Assessment System (AUSRIVAS) methods. There are no prerequisites for this non-award course, other than registration and payment. The theoretical knowledge required to use AUSRIVAS for river health assessment can be learnt entirely online in four interactive modules that can be completed at you own pace over 12 weeks.

A 5-day practical face-to-face workshop is offered as a fifth module, teaching the practical skills required. The workshop module is held in Canberra but if there is sufficient demand from a group or agency we can arrange a workshop in any State or Territory.

If you would like to enroll in the course or any individual module contact Sue (phone 02 6201 5408; Sue.Nichols@canberra.edu.au) or Evan (phone 02 6201 2080; Evan.Harrison@canberra.edu.au) for more information. Details at http://ausrivas.canberra.edu.au/Bioassessment/Macroinvertebrates/Training/

Centre for Water Research Online Software Training Courses

The Centre for Water Research (CWR) based at The University of Western Australia offers a range of process-based numerical models for simulation of the physical, chemical and biological dynamics within aquatic systems. Our software is used in over 90 countries by researchers, academics, utilities, regulatory agencies and environmental consultants. Software developed at CWR undergoes continuous development by our expert staff and through our international network of research partners to ensure that the most recent scientific and computational methods are incorporated. CWR models are designed to run on standard desktop computers at speeds of around 200 times real time for domains with the order of one million grid points.

CWR is offering two online courses of approximately three days each, designed to give students, researchers and industry professionals hands-on experience in using ELCOM (3D hydrodynamic model) and ELCOM-CAEDYM (aquatic ecology and water quality model). These models can be used for simulating estuaries, lakes, reservoirs and the coastal ocean, for eutrophication, pollution and climate change studies.

Courses will taught by **Dr Jason Antenucci** and will commence on October 4th and run on a continuous basis.

For further information please email: training@cwr.uwa.edu.au or go to: Click here for more details

NCCARF
National Climate Change Adaptation Research Facility
AND FRESHWATER BIODIVERSITY

Freshwater Biodiversity Climate Change Adaptation Research

Masterclass – call for participants

When: **14th - 18th November 2011**

Where: **University House, ANU, Canberra**

The Water Resources and Freshwater Biodiversity Adaptation Research Network is calling for applications from people interested in attending a technical masterclass on topics relating to the research, management and communication of climate change adaptation for Australian freshwater biodiversity. Specific topics to be covered include:

- Climate projections and future water scenarios (CSIRO Land & Water)
- Modelling climate change impacts on freshwater species (Drs Yung En Chee, Nick Bond & Mark Kennard)
- Bayesian networks for impacts modelling (Dr Carmel Pollino)
- Science to policy (Dr Fiona Dyer)
- Science communication (Prof. Julian Cribb)

Applications to attend the Masterclass are sought from researchers or managers currently working in areas relevant to climate change adaptation for freshwater biodiversity. PhD students and early career researchers are encouraged to apply. Up to 15 participants will be selected based on merit and responses to the selection criteria. All travel, accommodation, food and training expenses associated with attending the masterclass will be provided to successful applicants.

To apply, please submit a 2 page c.v. and a statement addressing the following selection criteria:

1. Understanding of broad issues associated with climate change impacts and adaptation with respect to Australian freshwater biodiversity
2. Aptitude for and willingness to learn new technical skills, e.g. using unfamiliar software
3. Relevance of current employment or studies to climate change adaptation for freshwater biodiversity
4. Capacity to use knowledge gained at masterclass to further research and/or management activities
5. Availability to attend masterclass

Please submit applications by email to Samantha Capon by **5pm Thursday 14th July** at s.capon@griffith.edu.au.

ACEAS Thresholds in Freshwater Ecosystems (TIFE) Working Group 2011-2012

Project title: A cup half full? Thresholds and regime shifts in Australian freshwater ecosystems

Working group leader: Dr Samantha Capon, Australian Rivers Institute, Griffith University

Australian freshwater ecosystems have undergone considerable change over the past century. Widespread decline in ecological condition, loss of biodiversity and dramatic shifts in ecosystem composition and function have been reported for many habitats and geographic regions. The extent to which this change is irreversible, however, and how much of it reflects
the inherent natural variability of these systems, is poorly known. Understanding whether or not species, ecological communities or processes have reached 'tipping points', beyond which changes are irrevocable, consequences dire and restoration unfeasible, clearly has significant implications for the management of our freshwater resources and assets, e.g. application of triage management approaches. Moreover, the ability to predict such ecological thresholds before they are reached will be vital for the conservation and management of these socially, economically and culturally critical ecosystems as we face a future characterised by increasing climate variability and ecological uncertainty. This Working Group will draw on a range of long-term ecological datasets for a variety of freshwater taxa, habitats and ecosystems from across the continent in order to address the following key questions:

1. Can comparable trends be detected amongst the changes in character of freshwater species, habitats and ecosystems that have been observed in Australia during the past century across geographic regions, ecosystem types or species?
2. Do any of the observed changes in the condition of freshwater species, habitats and ecosystems across Australian over the past century represent major shifts in ecological character or can they be considered within the bounds of acceptable variability?
3. Can long-term ecological datasets be interrogated so that past 'tipping points' can be identified and potential future thresholds predicted?
4. What management actions are appropriate in freshwater ecosystems where 'tipping points' have already been reached or where monitoring suggests that a 'tipping point' is being approached?

REPORTS FROM THE TRENCHES

INSTITUTE FOR APPLIED ECOLOGY FRESHWATER LABORATORY

UNIVERSITY OF CANBERRA

The last few months in the Institute for Applied Ecology Freshwater Laboratory have been quite busy with lots of field and lab work from various projects in and around the ACT. This is a change from last spring/summer when the majority of our field sampling was impossible because of large floods!

There have been many changes to the Freshwater Laboratory over the last 12.5 months. We are now fully settled in our new larger lab space in the main science building at the University of Canberra. A major change has been the retirement of **Richard Norris.** Over the last few months there have been a couple of functions to present Richard with the ASL medal and celebrate Richard's large contribution to freshwater ecology in Australia and internationally. Richard recently returned from an enjoyable trip to South America and is now an Emeritus Professor at the university. Congratulations on an excellent career Richard and best of luck for the future!

In some exciting news **Trefor Renyoldson** from Canada will be joining the Freshwater Laboratory as a visiting professor for a period of 12-18 months. Trefor is an adjunct professor at Arcadia University and was formally Research Scientist at the National Water Research Institute. His research has been directed at developing improved techniques for using benthic macroinvertebrate assemblages in diagnostic environmental assessment and the Reference Condition Approach, that he formalised as the basis of a national biomonitoring network for Canada. Trefor is looking forward to attending the ASL congress in Brisbane.

The University of Canberra has recently been the recipient of a major Collaborative Research Network (CRN) grant from the Commonwealth government. These grants were aimed at increasing the research capacity within universities that are not 'research intensive' by facilitating sustainable collaboration with other universities and research organisations. Our CRN brings together existing and emerging research strengths and collaborations at UC in environmental science, social and economic modelling, rural health, public policy and urban and regional planning to tackle issues of resilience in the Murray Darling Basin environment and communities. Partners include ANU, CSU, USQ. CSIRO Water for a Healthy Country, MDBA, DSEWPC, ABARES, NWC.

Evan Harrison and **Sue Nichols** both attended the North American Benthological Society Annual Meeting in Providence, Rhode Island. Both Evan and Sue participated in the special session on promoting evidence-based methods in environmental research and management (http://www.sgmeet.com/nabs/nabs2011/sessionschedule.asp?SessionID=S12). The session was well attended even though it was on the last day of the conference. Evan gave a presentation on a literature review that used Eco Evidence analysis to investigate the effects of fine sediment addition to streams on macroinvertebrate communities. Sue gave a presentation on environmental flow management in the Cotter River catchment in the ACT. Sue also helped run a workshop on Systematic Evaluation of Ecological Literature to Support Causal Inference: Tools and Methods (http://www.benthos.org/Annual-Meeting/2011-Providence/Workshops.aspx).

Fiona Dyer and Evan Harrison have been collaborating with Tony Jakeman, Barry Croke and Sondoss El Sawah of ANU to develop an integrated modelling framework for predicting water quality and ecological response to climate change in the Upper Murrumbidgee Catchment. Fiona will be presenting part of this work at the upcoming IUGG meeting in Melbourne in early July.

Katie Ryan received comments back from the reviewers of her PhD thesis "Macquaurie perch under pressure: predation risk to an endangered fish population" and only has to make small changes. Katie will graduate in July and is now working at the National Water Commission. Well done Katie!

PhD student, **Veronika Vysna's** initial seminar to the IAE in early May was very well received. Vika's working title is " The effect of land-use on carbon dynamics in the Paddys River catchment (ACT) and its relationship to river condition". Vika has now commenced her major field program and was last seen covering large sections of Paddy's River and it's catchment in cotton strips to measure decomposition!
Toni Furlonge has recently commenced her PhD with **Fiona Dyer** on macroinvertebrates and wetlands. Toni is based in Tasmania with NRM North and is co-supervised by **Peter Davies** (University of Tasmania) and **Jenny Davis** (Monash University).

MSc student **Anu Datta** has commenced a project examining the timing and spatial distribution of Murray cod reproduction in the upper Murrumbidgee River. Anu is supervised by **Mark Lintermans** and **Fiona Dyer**, with the project expected to provide a unique insight into cod reproduction in upland environments (in contrast to the well studied lowland habits of this species).

Vic Hughes has completed the first full draft of his PhD thesis "Hydraulic habitat in the River Murray: the influence of large woody debris" proving that there is light at the end of the very long thesis tunnel! Vic is now working through the slow process of editing each of his chapters while continuing to work part time and hopes to submit later in the year. .

The enlargement of Cotter Reservoir from 4GL to 78GL is proceeding, with the fish group at University of Canberra providing much of the underlying research to facilitate this. Research by **Mark Lintermans** and his team (**Ben Broadhurst, Jason Thiem, Brendan Ebner, Rhian Clear, Danny Wright, and Richard Norris**) provided guidelines for the placement of constructed habitats around the perimeter of the enlarged reservoir. The constructed habitat (made from complex rows of carefully placed boulders – see photo below) will provide vital refuge from avian predation for the endangered Macquarie perch that reside in the reservoir. It is hoped that the efforts made to accommodate Macquarie perch in the enlarged reservoir not only conserve this population but enable it to thrive. Attempts to establish additional populations of Macquarie perch via translocation from Cotter Reservoir continue, with more than 1200 fish relocated to three sites to date.

Constructed Macquarie perch habitat in Cotter Reservoir (Photo: Mark Lintermans, University of Canberra)

Evan Harrison

UNIVERSITY OF OTAGO

CLOSS LAB

Despite valid assumptions that the cold weather down in Dunedin, NZ has a numbing effect, it also has the advantage of needing to keep brains, bodies, and budgets HOT and on the move to stay mildly functional! So in between boiling the jug and knitting woolly ear muffs, Gerry Closs' freshwater team at Otago University have been putting their brains, bodies, and budgets to work, resulting in a suite of interesting and innovative research.....

Gerry Closs is catching up with various items of work after a period of sick leave - he managed to break his leg in Feb by crashing his bike where roadwork was in progress to make cycling safer. Final drafts of a paper coauthored with **Andy Hicks** and **Phil Jellyman** examining the role of amphidromy are being reviewed, and the results of the Fiordland amphidromous fish recruitment work are being analysed and the results written up.

Reality TV, Galaxiid style. NOW IN 3D!!
Aurélien Vivancos is exploring the social structure characteristics of juvenile galaxiid shoals in his PhD by using an innovative software tool called VidSync that will allow him to model in 3D fish movements and behaviour from stereo video footage. This will make a new range of quantitative data accessible to investigate fish behaviour and social structures.

Induced disturbance and heavy irrigation = galaxiid safe-havens?
For the first time in NZ, the use of the piscicide rotenone has been trialled by the Department of Conservation (DOC) to remove brown trout in two streams within Zealandia sanctuary in Wellington, refreshingly extending the rehabilitation of native ecosystems in sanctuaries beyond the birds, and into the water. **Lan Pham** is using this opportunity of major disturbance to study the recolonisation of invertebrates at small spatial scales, and the effects on the galaxiids which were re-introduced to the treated streams. The results and lessons learnt from this project have implications for using rotenone as a management tool to remove exotic species from threatened galaxiid habitats.

Heavily irrigated sections of streams may provide refuge for native galaxiids by creating unfavourable conditions (eg. low O2, high temperature) for their primary predators, brown trout (*Salmo trutta*). **James Shelley** is investigating this phenomenon in the intermittent Ida Burn catchment, a tributary of the Manuherikia River, throughout summer, over three spatial scales: catchment, reach, and hydromorphological unit (e.g. riffle, pool). In 2021 water leases in the Ida Burn will be renegotiated with a potential outcome being the return of minimum flows, so there is a pressing need to better understand the processes acting to maintain galaxiid populations within the catchment.

Peter Jones is carrying out an evaluation of implications for future Galaxiid species management and conservation by looking at the role of life history strategies in determining the distributions of native galaxiid species in Otago and Southland. His work will involve an analysis of the importance of amphidromy, fecundity and recruitment traits in influencing species' spatial distributions and abilities to co-occur with trout.

This picturesque stream within Wellington's Zealandia (Karori wildlife sanctuary) was treated with rotenone slurry in a Department of Conservation project trialling the use of the piscicide in flowing water to eradicate trout. Photo: Lan Pham

A rather unusual case of sex change?

Manna Warburton is wondering why there are more female torrentfish in the upper reaches of the rivers they live in. Torrentfish may have retained a marine sex determination system shared with the Sandperch (Pinguipedidae) that allows them to change sex at a specific point in their life history. Manna is planning to investigate this possibility, which would be extremely unusual for a freshwater fish, as part of his PhD thesis.

Torrentfish may have retained a marine sex determination system that allows them to change sex at a specific point in their life history. Photo - Manna Warbuton.

Delving deeper into our knowledge of native freshwater species

A decline in population density of the endemic fish, banded kokopu (*Galaxias fasciatus*), has been reported since European settlements in New Zealand. Habitat degradation due to land use practices is believed to have caused this decline. **Abbas Akbaripasand** is looking at the interactions between fish density, habitat characteristics and food webs in some small streams in Otago, questioning the drivers of habitat selection in fish populations. What is the relative importance of habitat structures (physical and chemical factors) and food abundance in habitat selection? Abbas is also interested in the calorific value of prey in fish diet to gain a better understanding of its role in food selection.

Jeff Vanderpham is currently in the final stages of his research on common bully morphological variation/plasticity and feeding behaviour. Several patterns in morphology related to life histories and habitat conditions, as well as a few anomalies have been identified. The final results promise to provide some interesting new details about one of New Zealand's most common freshwater species, as well as a better understanding of generalist morphology and phenotypic plasticity.

Andy Hicks has submitted his PhD thesis, and is awaiting the decision of the examiners. Andy is currently working with DOC Southland as a freshwater technical support officer while Emily Funnel is on maternity leave. **Nicholas Dunn** is also close to finishing his PhD examining the role of hydrology in shaping galaxiid morphology. **This is your life, Brook Char.**

Lance Dorsey's PhD project will assess the past, present, & future of Brook Char (*Salvelinus fontinalis*) in New Zealand. Lance plans to study brook char life history and their impact on native fish and invertebrates in headwater streams in Otago.

Trout – Lactose intolerant? Salinity savvy?

Javad Ramezani has completed his year long study of relationship between dairying, habitat condition and trout life history. A strong and consistent relationship has been found between the percentage of dairying in a catchment and a steady decline in the number of juvenile brown trout over the summer season.
Ramsmus Gabrielsson has completed all his field work on patterns of trout migration in the upper Clutha catchment. Trout otoliths collected from trout raised under varying salinity conditions will be analysed in Melbourne in May. The results from this analysis will be used to validate relationships between ambient environmental and otolith concentrations of various trace elements.
Abbey Reith is close to completing her MSc thesis on trout recruitment and migration in the lower Clutha. Abbey has started teacher training in Christchurch and is fitting in the thesis writing around class preparation.
Leonie Kücholl is currently analysing the result of her latest experiment to find out if temporal predictability of food is as important for the behaviour and dominance structure of juvenile brown trout as spatial predictability.

Our remarkable estuaries: a rough road ahead!

Estuaries are probably the most vulnerable eco-system to Global climate change, especially in regard to rising sea levels. In estuaries mysid shrimps are the critical link between benthic and pelagic food webs, and form a large proportion of faunal biomass. **Sourav Paul** is working on modelling distribution, inter-specific competition and population dynamics of *Tenagomysis spp* in estuaries of New Zealand to predict how they may respond to potential climate change.
Beate Bierschenk is looking at the life history and distribution of estuarine mysids in the Taieri River. Two species, *Gastrosaccus australis* and *Tenagomysis macropsis,* exhibit marked seasonal/ontogenetic change in distribution along the estuary, which seems quite remarkable given that they are primarily pelagic species and are able to maintain position in this highly variable environment. Beate is currently completing a final experiment examining how water turbulence influences mysid orientation and swimming behaviour.

Rocking the snot

Vanessa Hammond has been working on her year's worth of didymo data collected from Otago rivers, with strong relationships between river regulation and nutrients emerging. Vanessa is about to take some time out from thesis writing for the birth of her second child, but is still aiming to complete her PhD by the end of the year.

When keeping the pipes clear isn't the most ideal scenario

Michael Greer is currently heading a ministry of agriculture's sustainable farming funded project for his masters research. By using faunal surveys and radio telemetry he aims to determine the effect of current drain clearing techniques on the native fish assemblage of Southland drains. His work also includes trialling two alternative techniques in hope of limiting this impact. The first involves clearing only half the drains in alternating fifty metre sections, so half the overall habitat remains intact. The second involves placing artificial refuge structures in cleared drains.

Linking agriculture to trematodes

Sabrina Hock's area of research focuses on the indirect effects agricultural run-off has on trematodes in freshwater ecosystems. To be specific, she is looking at the proliferation and transmission of trematodes in the New Zealand mud snail, *Potamopyrgus antipodarum*.

Lan Pham

WATER STUDIES CENTRE, MONASH UNIVERSITY

Despite her fervent belief the day would would never come, **Sam Imberger** (supervisors **Mike Grace** and **Ross Thompson**) submitted her PhD thesis on Friday 17th June. The handing in was made more exciting by the accompanying horde of fellow students and staff blowing whistles, banging drums and (mostly) wearing silly hats. The following Monday it was back to work in her post-doc position with **Chris Walsh** at Melbourne Uni. Sam will be missed by all at the WSC as she has been a wonderful contributor to the Centre for close to a decade. **Wei Wen Wong** (supervisors **Perran Cook, Mike Grace** and **Ian Cartwright**) is off to the Goldshmidt conference in Prague during August to present some of her PhD research on identification of nitrate sources sinks and transformations in the Werribee River estuary. **Yassir Arafat** (PhD student, supervisors Perran Cook and Mike Grace) is busy in the lab and field getting results for his ASL talk in Brisbane. Yassir is looking at nutrient transformations and transport through the aquatic phases of a dairy property (stream and large farm dam) in a joint ARC Discovery Project Melbourne Uni (**Andrew Western, Tony Weatherly** and **Russell Adams**). **Keryn Roberts** has successfully passed the confirmation hurdle stage of her PhD study which is trying to unravel the mysteries of the nitrogen cycle in a periodically anoxic estuary (the Yarra; Keryn's supervisors are Perran Cook, **Brad Eyre** from Southern Cross Uni and Mike Grace). **Todd Scicluna** (Perran Cook and Mike Grace) is rapidly approaching his confirmation panel and seminar. Todd's looking at the interactions of iron and sulfur in phosphorus biogeochemistry in a range of fresh, estuarine and marine waters. **Adam Kessler** is now getting some excellent results for his BSc(Hons) project (supervisor Perran Cook) from his experimental flume where he is looking at the role of advection in nutrient dynamics in sand riffles. We wish **Vera Folkman** a wonderful time during her upcoming trip to Germany next month with her fiancé, Julien, and congratulations on your engagement!

Mike Grace had a thoroughly enjoyable and scientifically fantastic sabbatical at the Cary Institute of Ecosystem Studies, in Millbrook, New York, from July 2010 until January 2011. Apart from the opportunity to explore many parts of the US with his family, including his children spending four months in American schools, he got to work on some really interesting aquatic ecosystems. He continued his collaboration with Jen Tank, Emma Rosi-Marshall, Bob Hall and Michelle Baker on the NSF-funded 'Big Rivers' project, where fieldwork was on the Snake River in Wyoming and on the Salmon River Idaho. (Random ecological note – many small streams in the Salmon watershed were experimental sites instrumental in the development of the River Continuum Concept). He also spent time discussing denitrification in urban streams with Peter Groffman's Group and was shown the dubious splendour of urban streams in Baltimore in December by Emma Rosi-Marshall. His major experimental project was with Stuart Findlay, looking at the role of vegetation and wetting and

drying on nutrient biogeochemistry and green-house gas generation in freshwater, tidal wetlands in the Hudson River. This was the subject of Mike's talk at the recent NABS conference in Providence. While at NABS, Mike enjoyed catching up with a former WSC student, **Dr Katrina Lansdown** who is just entering the final year of her post doc at Queen Mary, University of London where she's been investigating denitrification in a range of UK streams.

Mike Grace

INSTITUTE FOR APPLIED ECOLOGY
FRESHWATER LABORATORY
UNIVERSITY OF CANBERRA

The last few months in the Institute for Applied Ecology Freshwater Laboratory have been quite busy with lots of field and lab work from various projects in and around the ACT. This is a change from last spring/summer when the majority of our field sampling was impossible because of large floods!

There have been many changes to the Freshwater Laboratory over the last 12.5 months. We are now fully settled in our new larger lab space in the main science building at the University of Canberra. A major change has been the retirement of **Richard Norris.** Over the last few months there have been a couple of functions to present Richard with the ASL medal and celebrate Richard's large contribution to freshwater ecology in Australia and internationally. Richard recently returned from an enjoyable trip to South America and is now an Emeritus Professor at the university. Congratulations on an excellent career Richard and best of luck for the future!

In some exciting news **Trefor Renyoldson** from Canada will be joining the Freshwater Laboratory as a visiting professor for a period of 12-18 months. Trefor is an adjunct professor at Arcadia University and was formally Research Scientist at the National Water Research Institute. His research has been directed at developing improved techniques for using benthic macroinvertebrate assemblages in diagnostic environmental assessment and the Reference Condition Approach, that he formalised as the basis of a national biomonitoring network for Canada. Trefor is looking forward to attending the ASL congress in Brisbane.

The University of Canberra has recently been the recipient of a major Collaborative Research Network (CRN) grant from the Commonwealth government. These grants were aimed at increasing the research capacity within universities that are not 'research intensive' by facilitating sustainable collaboration with other universities and research organisations. Our CRN brings together existing and emerging research strengths and collaborations at UC in environmental science, social and economic modelling, rural health, public policy and urban and regional planning to tackle issues of resilience in

the Murray Darling Basin environment and communities. Partners include ANU, CSU, USQ. CSIRO Water for a Healthy Country, MDBA, DSEWPC, ABARES, NWC.

Evan Harrison and **Sue Nichols** both attended the North American Benthological Society Annual Meeting in Providence, Rhode Island. Both Evan and Sue participated in the special session on promoting evidence-based methods in environmental research and management (http://www.sgmeet.com/nabs/nabs2011/sessionschedule.asp?SessionID=S12). The session was well attended even though it was on the last day of the conference. Evan gave a presentation on a literature review that used Eco Evidence analysis to investigate the effects of fine sediment addition to streams on macroinvertebrate communities. Sue gave a presentation on environmental flow management in the Cotter River catchment in the ACT. Sue also helped run a workshop on Systematic Evaluation of Ecological Literature to Support Causal Inference: Tools and Methods (http://www.benthos.org/Annual-Meetin~/2011-Providence/Workshops.aspx).

Fiona Dyer and Evan Harrison have been collaborating with Tony Jakeman, Barry Croke and Sondoss El Sawah of ANU to develop an integrated modelling framework for predicting water quality and ecological response to climate change in the Upper Murrumbidgee Catchment. Fiona will be presenting part of this work at the upcoming IUGG meeting in Melbourne in early July.

Katie Ryan received comments back from the reviewers of her PhD thesis "Macquaurie perch under pressure: predation risk to an endangered fish population" and only has to make small changes. Katie will graduate in July and is now working at the National Water Commission. Well done Katie!

PhD student, **Veronika Vysna's** initial seminar to the IAE in early May was very well received. Vika's working title is " The effect of land-use on carbon dynamics in the Paddys River catchment (ACT) and its relationship to river condition". Vika has now commenced her major field program and was last seen covering large sections of Paddy's River and it's catchment in cotton strips to measure decomposition!
Toni Furlonge has recently commenced her PhD with **Fiona Dyer** on macroinvertebrates and wetlands. Toni is based in Tasmania with NRM North and is co-supervised by **Peter Davies** (University of Tasmania) and **Jenny Davis** (Monash University).

MSc student **Anu Datta** has commenced a project examining the timing and spatial distribution of Murray cod reproduction in the upper Murrumbidgee River. Anu is supervised by **Mark Lintermans** and **Fiona Dyer**, with the project expected to provide a unique insight into cod reproduction in upland environments (in contrast to the well studied lowland habits of this species).
Vic Hughes has completed the first full draft of his PhD thesis "Hydraulic habitat in the River Murray: the influence of large woody debris" proving that there is light at the end of the very long thesis tunnel! Vic is now working

through the slow process of editing each of his chapters while continuing to work part time and hopes to submit later in the year. .

The enlargement of Cotter Reservoir from 4GL to 78GL is proceeding, with the fish group at University of Canberra providing much of the underlying research to facilitate this. Research by **Mark Lintermans** and his team (**Ben Broadhurst, Jason Thiem, Brendan Ebner, Rhian Clear, Danny Wright, and Richard Norris**) provided guidelines for the placement of constructed habitats around the perimeter of the enlarged reservoir. The constructed habitat (made from complex rows of carefully placed boulders – see photo below) will provide vital refuge from avian predation for the endangered Macquarie perch that reside in the reservoir. It is hoped that the efforts made to accommodate Macquarie perch in the enlarged reservoir not only conserve this population but enable it to thrive. Attempts to establish additional populations of Macquarie perch via translocation from Cotter Reservoir continue, with more than 1200 fish relocated to three sites to date.

Evan Harrison

Constructed Macquarie perch habitat in Cotter Reservoir (Photo: Mark Lintermans, University of Canberra)

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